DCI Director of
Central
Intelligence

DEPARTMENT OF STATE

BUREAU Of INTELLIGENCE AND RESEARCH

AUTOMATED INTELLIGENCE SUPPORT STUDY

Prepared for the
DIRECTOR OF CENTRAL INTELLIGENCE
by the Intelligence Community Staff

September 1983

DEPARTMENT OF STATE
BUREAU OF INTELLIGENCE AND RESEARCH
AUTOMATED INTELLIGENCE SUPPORT STUDY

September 1983

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which are classified CONFIDENTIAL.)

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EXECUTIVE SUMMARY

This study of the automated support found within the Department of State's Bureau of Intelligence and Research (INR) is provided to the House Permanent Select Committee on Intelligence pursuant to the Classified Annex to the Committee's Report 98-189 accompanying the Intelligence Authorization Bill for Fiscal Year 1984 (H.R. 2968). The Committee requested that a study be undertaken by the Director of Central Intelligence to report upon the following to the Committee by September 30, 1983:

— definition of the Bureau of Intelligence and Research's automation requirements;

— identification of Community ADP developmental efforts or systems currently in operation which may be applicable to the Bureau's needs;

— establishment of a plan for achieving an improved ADP capability for the Bureau within a reasonable period of time; and

— development of resource recommendations to be factored into the FY 1985 budget development process.

The Study Officer for this study, Mr. David J. Walrath, was assigned from the Intelligence Information Handling Committee of the Intelligence Community Staff (IC Staff). The Study Officer reviewed available documentation regarding the INR system and other similar Intelligence Community systems and conducted interviews with the staffs of INR, State's Information Systems Office (ISO) and Office of Communications; the Air Force Intelligence Service staff; CIA/DIA's SAFE Project Office; and the MAXI prime contractor, Inco, Inc., to prepare this study. This study has been reviewed by the management of the Department of State and the IC Staff.

The Bureau of Intelligence and Research presently has installed a single Digital Equipment Corporation PDP 11/70 computer with one magnetic disk unit. Message traffic is received on dedicated circuits from NSA and CIA into this system. If an intelligence analyst desires to retrieve a message, the analyst has to obtain the message's number and retrieve it based upon this information. The system also provides the analyst with the capability of viewing incoming traffic immediately upon receipt in the INR system. FLASH and CRITIC messages are displayed immediately. In addition to this system, INR also has access to COINS (Community On-Line Information System) and the State Department's Foreign Affairs Information Management System (FAIS) via separate terminals to each. An analyst is required to query each of these systems separately if, in the production of an intelligence report, the analyst desires to obtain available information from each system.

Since 1975-1976 INR, with the support of State's ISO, has been attempting to upgrade the present system. The present system has evolved from this effort but has not achieved the desired features envisioned in the mid-1970s.

In order to satisfy the demanding intelligence production problem which is required of INR, the intelligence analyst must have access to all sources of information as quickly and as accurately as possible. The current system does not presently provide this capability. INR requires a system which will provide the following operational functions:

— automatic dissemination of incoming messages from CIA, NSA, and Department of State;

— message retrieval capability;

— system interfaces to COINS and FAIS through the analyst's terminal;

— message preparation capability (a word processing suite of functions);

— message transmission capability; and

— analyst's working files.

Other functions such as security, automatic receipt and acknowledgement of special messages, ease of operation and support, and 24-hours-per-day, 7-days-per-week operation are inherent in INR's automated system requirements.

A review of available ADP systems, either in the development phase or currently in operation, was made throughout the Intelligence Community. The only systems which appeared to approach INR's requirements were the MAXI system, developed by the Air Force under the CUBIC program, and the CIA/DIA SAFE system. The SAFE system is not presently an integrated analyst support system, and it would be very difficult and extremely costly to incorporate SAFE into the ADP support role for INR. The MAXI system, however, is in operation at fourteen DODIIS installations, and its capabilities appear to mesh with INR's requirements.

The MAXI system is designed to support an analyst by providing a medium size configuration. The MAXI's UNIVAC 1652 terminal is being replaced with a less expensive, but fully compatible, terminal. The use of one PDP 11/70 could provide INR with ADP support to meet its immediate requirements. A two PDP 11/70 configuration could provide INR with its long-term requirements. The MAXI system has been well received by the DODIIS community, and the Air Force has provided excellent technical support.

Based upon the analysis found within this study, it is concluded that INR's ADP support has progressed on a piecemeal fashion since 1976. INR has had high expectation for its ADP support, and they have not materialized. Because of stringent personnel and funding limitations, ISO has been unable to deliver a responsive system to date. In order to overcome these problems, it is recommended that the following ADP plan be executed by INR with support from the IC Staff, other offices of the Department of State, OMB, and the Congress:

• Continue with the installation and implementation of the COINS interface.

• Continue with the development and implementation of the profiles software capability for the distribution of NSA traffic based upon TAGS, if it proves to be satisfactory.

- Engage a contractor for a seven-month period to determine INR's 1984-1995 ADP requirements. The results of this analysis would include an examination of the MAXI system and other proven information handling systems as a possible candidate to meet INR's requirements. As a result of this analysis, a determination should be made either to proceed with further development of the present INR system or to install the MAXI or some other alternate system.

- Designate, select, or hire an individual reporting to the Deputy Secretary for INR who would work within INR and whose only responsibility would be to manage the upgrade of INR's ADP support. A "Verification and Validation" (V&V) contractor should be hired to support this individual.

- Purchase no additional terminals, OCR, etc., to support INR's ADP until the above study is completed.

- A technically competent individual from the IC Staff should be assigned the responsibility to monitor, offer suggestions, and aid in the development of INR's ADP support.

- Because the Information Systems Office will become engaged in their own major system upgrade, INR should contract elsewhere for system support.

In order to implement the above recommendations, an additional appropriation of funds or reprogramming of FY 1984 resources will be required. Subsequent to initial hardware acquisition for the present system, the resources allocated to ADP support within INR have been small or non-existent. In order to obtain ADP par with other Intelligence Community organizations, a little more than $3 million will have to be spent for ADP support over the next five years. Without adequate INR staff support, which is found within the recommendations, no resources of this magnitude should be provided.

INTRODUCTION

This section describes the authority and requirements for this study, the past and existing relationships between the Intelligence Community Staff (IC Staff) and the Department of State's (DOS) Bureau of Intelligence and Research (INR), and the study methodology chosen to investigate the automation requirements at INR.

Authority for Study

Within the Classified Annex to the House Permanent Select Committee on Intelligence (HPSCI) Report 98-189 which accompanied the Intelligence Authorization Bill for Fiscal Year 1984 (H.R. 2968), the Committee requested that a study be undertaken by the Director of Central Intelligence (DCI) to investigate and report by 30 September 1983 on automation support at INR. The following paragraph is extracted from the above:

"The Committee finds that INR lags woefully behind in its efforts to provide automated intelligence support to its analysts. While this shortfall may be due in part to INR's physical location problems, the Committee is convinced that another contributing factor is the lack of a capability on the IC Staff to identify such ADP gaps within the Community and to help solve them. The Committee directs, therefore, that the DCI undertake a study which (a) defines INR's automation requirements, (b) identifies Community ADP development efforts or systems currently in operation which may be applicable to INR's needs, and (c) establishes a plan for achieving an improved ADP capability for INR within a reasonable period of time. This study should be completed no later than September 30, 1983, in order that related resource recommendations may be factored into the fiscal year 1985 budget development process. The Committee also desires that it be provided a summary of the results of the study within 15 days of completion."

IC Staff/INR Relationships

Throughout the past several years the IC Staff has monitored the ADP program and budget activities of INR as a part of the National Foreign Intelligence Program (NFIP). These activities have included reviewing technical plans in relation to budget submissions, offering suggestions relating to anticipated problems, and participating in management reviews. The portion of the IC Staff which now supports the Intelligence Information Handling Committee (IHC) was responsible for developing and supplying this study to the Committee.

INR Study Methodology

Upon receipt of the HPSCI study request, an IC Staff Study Officer was assigned. A study schedule was developed and coordinated with the Office of the Director of Intelligence and Research. The study methodology involved in-depth review

of available documentation and interviews with INR staff personnel and systems analysts from the Department of State's Information Systems Office (ISO). Numerous meetings took place between the IC Staff Study Officer and these staffs in order to determine the present status of the INR automation program, to determine system requirements, and to project INR's future system requirements as compared with existing and planned ADP system capability found within the Intelligence Community. Other meetings took place with DOS's Office of Communications, Air Force Intelligence Service staff; CIA/DIA's SAFE Project Office; and the MAXI prime contractor, Inco, Inc.

MISSIONS AND OBJECTIVES

This section will review the missions and automation objectives of INR.

INR Missions

The Bureau of Intelligence and Research was established by Executive Order 9621 of September 20, 1945, which transferred the research and analytical functions of the Office of Strategic Services to the Department of State. INR is the only DOS element found within the NFIP. INR has the following missions:

- to provide raw and finished intelligence to the Department of State (particularly the Secretary and other principal officers) from the Intelligence Community, to produce finished intelligence of its own for the Department, and to participate in writing Community-wide intelligence assessments and estimates; and

- to coordinate for the Department of State United States intelligence activities to ensure that they support US foreign policy interests.

INR supplies intelligence information to meet policymakers' needs, to provide a professional intelligence analyst's viewpoint of developments abroad, and to ensure that the DOS both benefits from and contributes to the workings of the Intelligence Community. INR differs from other parts of the Community in that it has no field representatives to collect intelligence but rather uses information gathered by the Foreign Service, CIA, Department of Defense intelligence components, the FBI, and the Foreign Broadcast Information Services as well as "public" information. Although the INR products are distributed to other agencies, including the National Security Council and its staff, the reports are intended for the specific needs, requirements, and responsibilities of the Secretary of State and the Secretary's principal assistants.

INR Automation Objectives

The automation objectives of INR are as follows:

— on-line, real-time analyst support;

— electronic dissemination of DOS traffic and traffic from other agencies, i.e., NSA, CIA, and DIA;

— storage and retrieval of full text of electrically disseminated intelligence reporting;

— storage and retrieval of products produced on INR's WANG terminals (word processing equipment);

— integration of word processing composed documents;

— provision for continuous operation, 24 hours per day, 7 days per week;

— local inter-analyst communications;

— potential for system growth;

— provision for system security;

— capability to exchange, transmit, and receive hardcopy and microfiche with other IC members;

— automatic retrieval of microfiche from INR's microfiche data base;

— online interface with COINS; and

— provide a paperless work atmosphere for the analyst.

ORGANIZATIONAL AND MANAGEMENT STATUS

This section describes the relationships among the organizations of INR and the DOS. Also found within this section is a profile of the resources spent for INR's automation over the past several years.

DOS Organization

The Department of State is organized into 26 bureaus reporting to the Secretary/Deputy Secretary of State, Figure 1. Automation support for INR is provided by the Information Systems Office (ISO) found within the Bureau of Administration which reports to the Under Secretary for Management. INR is headed by a Director with the rank and authority of an Assistant Secretary of State, Mr. Hugh Montgomery, and is one of 26 bureaus that reports to the Secretary of State.

INR Organization

The staff of the Bureau of Intelligence and Research is comprised of about 300 people, both Civil Service and Foreign Service Officers. About 225 of these individuals are foreign affairs and intelligence analysts; the remainder are clerical, administrative, or other support staff specialists. INR is organized into staffs as follows, Figure 2:

Current Analysis - Six offices of this group correspond to the principal geographic areas of the world. The seventh office performs politico-military
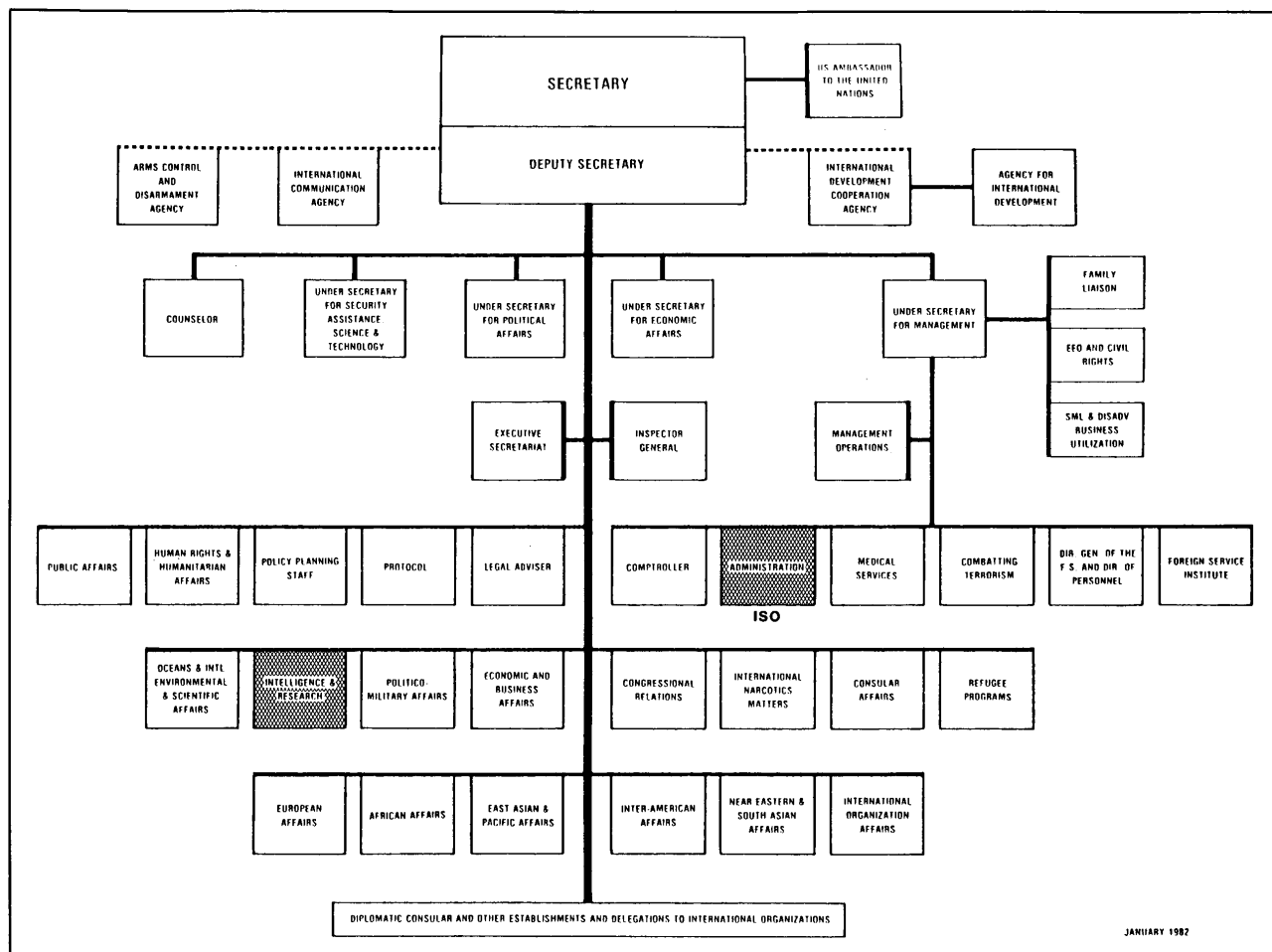
Department of State

Figure 1
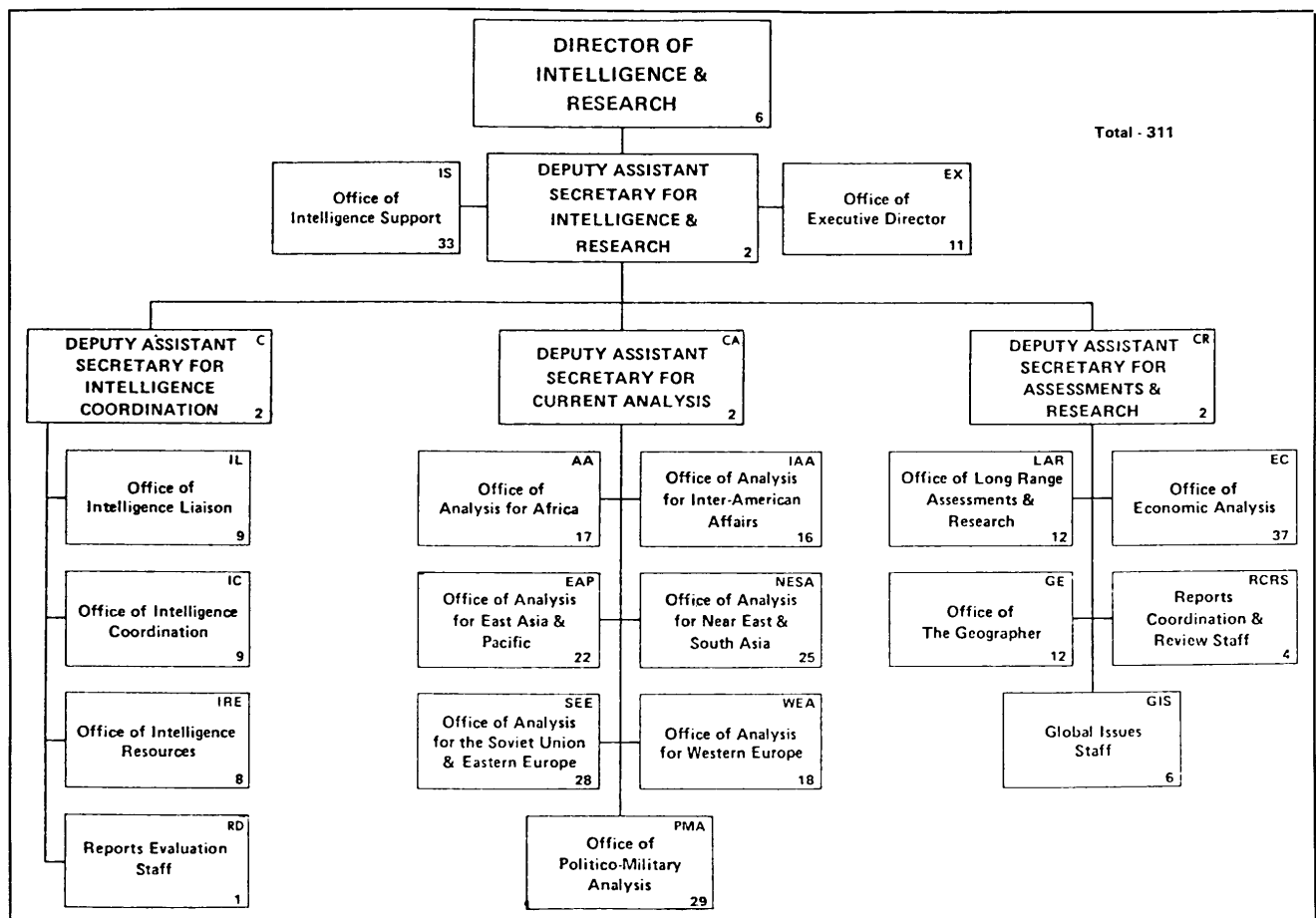
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│  │ Support   33 │    │  INTELLIGENCE &       │  │  Director  11│                    │
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analysis. These offices produce analyses of developments and issues that are, or will be, of concern to policymakers. They prepare regional and other special summaries for briefing senior officers and for preparing the INR contributions to Community-wide estimates and assessments.

Assessments and Research - The primary responsibility for this staff is the preparation of the Bureau's long-range (six months or more) analytical studies. The offices of this staff prepare long-range assessments on selected topics involving international economic concerns, physical, cultural and political issues, and produce special maps for DOS and other agencies.

Intelligence Coordination - This staff functions as the focal point between INR and other elements of the Intelligence Community, DOS, and missions overseas on the conduct and direction of all US Government intelligence collection activities having significance for foreign affairs.

Office of Executive Director - This staff provides management and administrative services for INR, including budget preparation.

Office of Intelligence Support - This staff holds the current intelligence responsibility which includes preparation of the Secretary's Morning Summary, document and security controls, and the communications and information handling functions of INR.

INR ADP Support

ADP support for INR's computerized information handling program is found within the Office of Intelligence Support. The staff is led by Mrs. Eileen Vanderburgh, Chief, Information Handling. Mrs. Vanderburgh and her staff are responsible for other information handling areas within INR such as microfilm production, hardcopy dissemination, etc., which are not really "ADP" oriented. (It is noted that in the FY 1984 Consolidated Budget Justification Books for INR dated January 1983, a Director of Information Handling is designated as being responsible for implementing the Bureau's computerized handling program. This individual did not contribute to the IC Staff's understanding of INR's ADP system throughout the term of this study. It is believed that the Director of Information Handling is an alternate title for Director, Office of Intelligence Support. There has been a recent SES vacancy announcement, DOS SES 4-83A, recruiting an individual for this position. Within the qualifications for managerial and technical requirements, no mention is made of any knowledge in ADP or automation as being a desirable consideration for a possible candidate.)

The programming and systems support for INR is provided by a single individual, Mr. Peter Kurtz, within ISO. A meeting was held during this study with Mrs. Ann Berna, Mr. Kurtz's supervisor.

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INR AUTOMATED SYSTEM REQUIREMENTS

This section will examine the ADP requirements that are now envisioned to support INR. The goal of INR's management is to provide an automation system which would provide a "paperless" atmosphere for the analyst within the secure renovated area of INR. The only comprehensive requirements documentation that appears to be available which defines INR's automation system requirements is entitled "INR Information Handling System" prepared by the Information Systems Office, dated November 1975 and revised March 19, 1976. This section is based upon the contents of the above document as well as other memoranda and conversations with Mrs. Vanderburgh. The system requirements found below are general but are complete in scope. Any definition beyond this level would be outside of the time and resources available for this study.

System Requirements

In order to achieve INR's goal, the following requirements are necessary:

Message Dissemination - Message traffic from NSA, CIA, and DOS must be identified as they enter the "system" and then routed to the proper analyst based upon an analyst profile of characteristics which are resident in the system. The system should be able to handle 1,000 messages per day at a minimum and ultimately a maximum of 3,000 messages per day.

Message Retrieval - An analyst must have the ability to search the incoming file of messages and retrieve a message based upon a new profile or certain special characteristics. The system should be capable of storing the full text of traffic for three months, excluding NSA's traffic, which is available through SOLIS.

System Interfaces - The INR system must be capable of electrical interfaces with the COINS network for access to other information data bases found within the Community and to the DOS Foreign Affairs Information Management System (FAIS) to access message traffic being received from DOS's posts throughout the world.

Message Preparation - The system must provide an analyst with the ability to retrieve a message from online data base storage, edit or revise the message, delete or add new information, combine several messages into one, and add the proper address(es) for transmission of the message. This requirement includes some of the basic suite of functions which would normally be found within a word processing system.

Message Transmission - The system must be able to accommodate the transmission of a message composed by an analyst after supervisory release approval. The transmission should automatically include the addition of the proper message structural format. The system must be able to decide automatically upon the proper routing, i.e., via NSA, CIA, or DTS (Diplomatic Telecommunications System).

Analyst Files - The system must be able to provide the analyst with storage so that separate, secure, and private working files can be maintained.

Special Functions - Special receipt, acknowledgement, transmission, and alarm functions must be provided for system service, special captioned, FLASH, and CRITIC messages.

Protection Functions - All incoming and outgoing system messages must be recorded in a journal. Incoming and outgoing messages and journals must be protected from operator or analyst alterations. The system must be protected with software and personnel safeguards to ensure that security is not violated.

Operation - The system must be easy to operate and maintain and must support system modifications. The system should ultimately be able to support 50 terminals with a minimum of 15. The hardware and software should be state-of-the-art. The system must be available for operation 24 hours per day, 7 days per week, with a 99% availability. If a new system is installed, it should have been installed and in operation at other Government sites prior to installation at INR.

Additional Requirements

The above represents ADP operational and system requirements which must be met based upon INR's traditional ADP needs. A further category of requirements exists that is undefined. This category relates to:

— integration of the ADP system into INR's information flow and vice versa;

— understanding and minimizing the flow of paper and products within INR;

— defining additional areas requiring ADP support above and beyond those already known; and

— appraising additional future anticipated areas of information flow.

Any design of an ADP support system to meet INR's requirements must recognize INR's total present and future information handling requirements.

INR ADP SYSTEM STATUS

This section provides background for the present automated system in use at INR. Also included are configuration diagrams of the present hardware systems, their capabilities, and the planned system upgrades.

System Background

The scope of the present system was defined in the document entitled "INR Information Handling Systems," dated November 1975 and revised March 19, 1976, prepared by the Information Systems Office of DOS. In comparing this documentation with the present system there appear to be numerous shortfalls. ISO is still working from these specifications to implement the features described. The present hardware system was installed in the 1979-1980 time period. The ISO configuration of dual IBM 370/158s to support the DOS FAIS requirements have been in operation for ten years and upgrades are planned in the near future, possibly the first quarter of FY 1984.

Present System

Figure 3 illustrates the equipment presently employed by INR to support analysts. Traffic is received in an asynchronous configuration directly from NSA and CIA through DOS's communications facilities into the INR PDP 11/70 computer. INR receives approximately 700 messages per day from NSA and 25 messages per day from CIA. An analyst, at a Model 40 CRT, can retrieve NSA or CIA traffic by message number or NSA product designation, assuming he has been made aware of the existence of the message. The full text of the traffic from NSA and CIA is stored on one disk associated with the PDP 11/70 for a period of about one week. NSA traffic not stored in the INR system can be retrieved via COINS after it is purged from the system. No traffic is retained in hardcopy format after six months. A printer in the Current Intelligence Staff (CIS) lists the message reference number, not full text, of all NSA and CIA traffic to ensure that messages are not lost. The locations of INR's Teletype Model 40 terminals are found in Table 1.

System backup is provided to the INR PDP 11/70 computer by use of a spare PDP 11/70 which is also used for testing and software debugging.

DOS traffic is received on one of the two IBM 370/158 systems of ISO, FAIS, and is stored in online disk files for approximately three years. Upon receipt, the text of each message is stored on line and is thereafter retrievable by message reference number. Each night batch jobs are executed to (1) create computer output microfilm
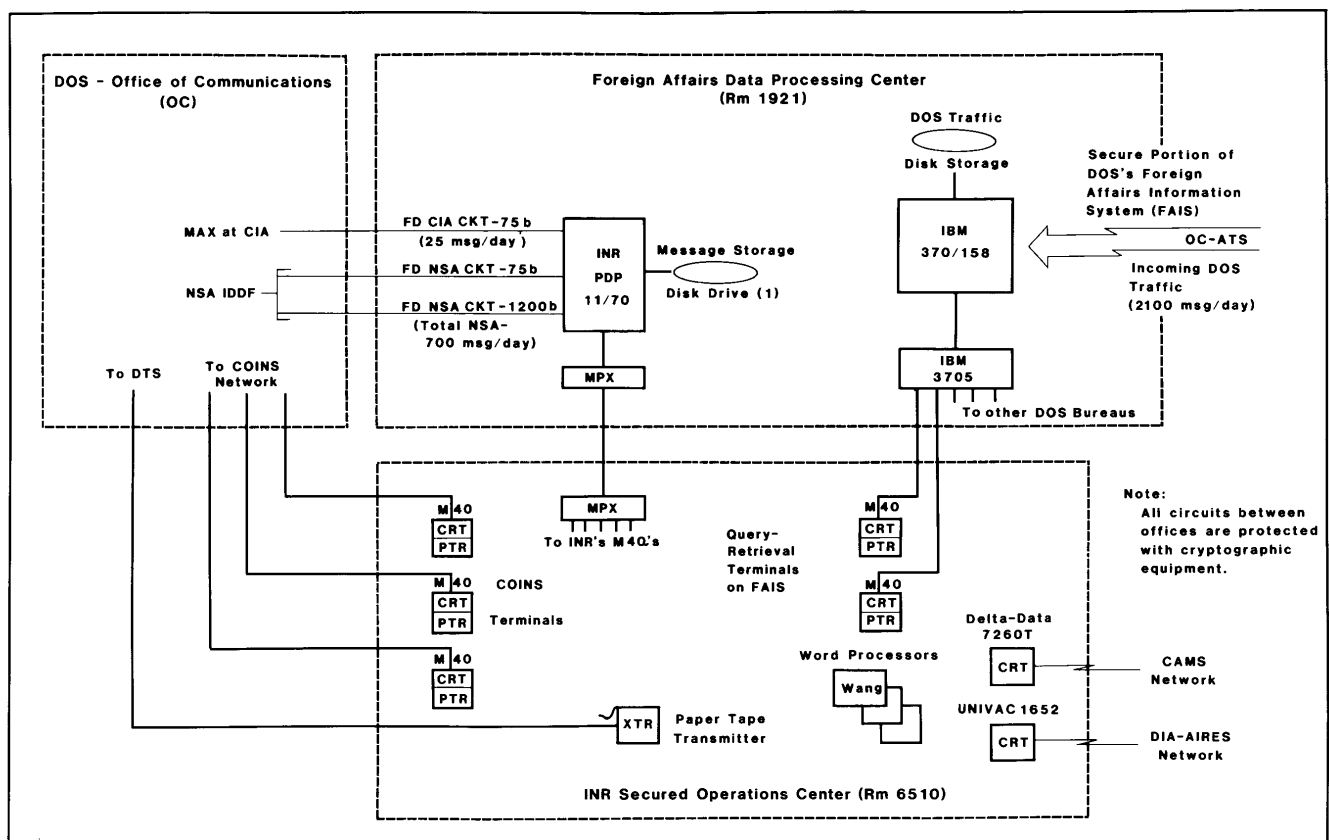
INR's Present Operating Configuration
Figure 3

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Activity	Location (Rm)	Model 40	
		CRT	PTR
TTY Branch	6510	2	2
CIS	6510	2 *	3 *
CIS	7th Floor Watch Center	1 *	—
IAA	6510	1	—
AA	6510	1	—
NESA	6510	1 *	1 *
EAT	6510	1	—
SEE	6510	1 *	1
WEA	6510	1	—
REC	6510	1 *	1 *
PMA	6510	1 *	1 *
Shared	6510	—	6
TOTAL		13	15

* Installed

Location of INR's Model 40 Terminals

TABLE 1

of the messages that were received that day and (2) create index records, called citations, from the message text. The computer extracts bibliographic data, such as originator, addressee, classification, and date and author-applied subject descriptors called TAGS (Traffic Analysis by Geography and Subject) to create the citations which are stored on line. The next day indexers complete the citations by correcting errors flagged by the computer and adding subject concepts and other data. The complete citations are available for retrieval by bibliographic elements and indexer-applied information the following day.

Citations for hardcopy documents (those not received by electrical means) are stored in the FAIS system also. All citations remain stored in online disk files for no less than six years. Text of messages can be retrieved by message reference number. Some special categories of traffic are not available to INR through FAIS because of their sensitivity.

Three dedicated terminals in INR are available for access to the COINS network. Within the imagery section of INR, AIRES and CAMS terminals are available.

In summary the present INR automated system is a short-term storage for NSA and CIA messages. Access to COINS files and DOS messages have to be accomplished via separate terminals. No retrieval of traffic is available through the INR system terminal except for NSA and CIA traffic. If an analyst desires to create

a message from the existing retrieved traffic, he has to obtain a hardcopy, add the address(es), and manually enter the new message into the system. Outgoing messages are prepared as hardcopy, and a paper tape is produced for transmission.

Planned System Configuration

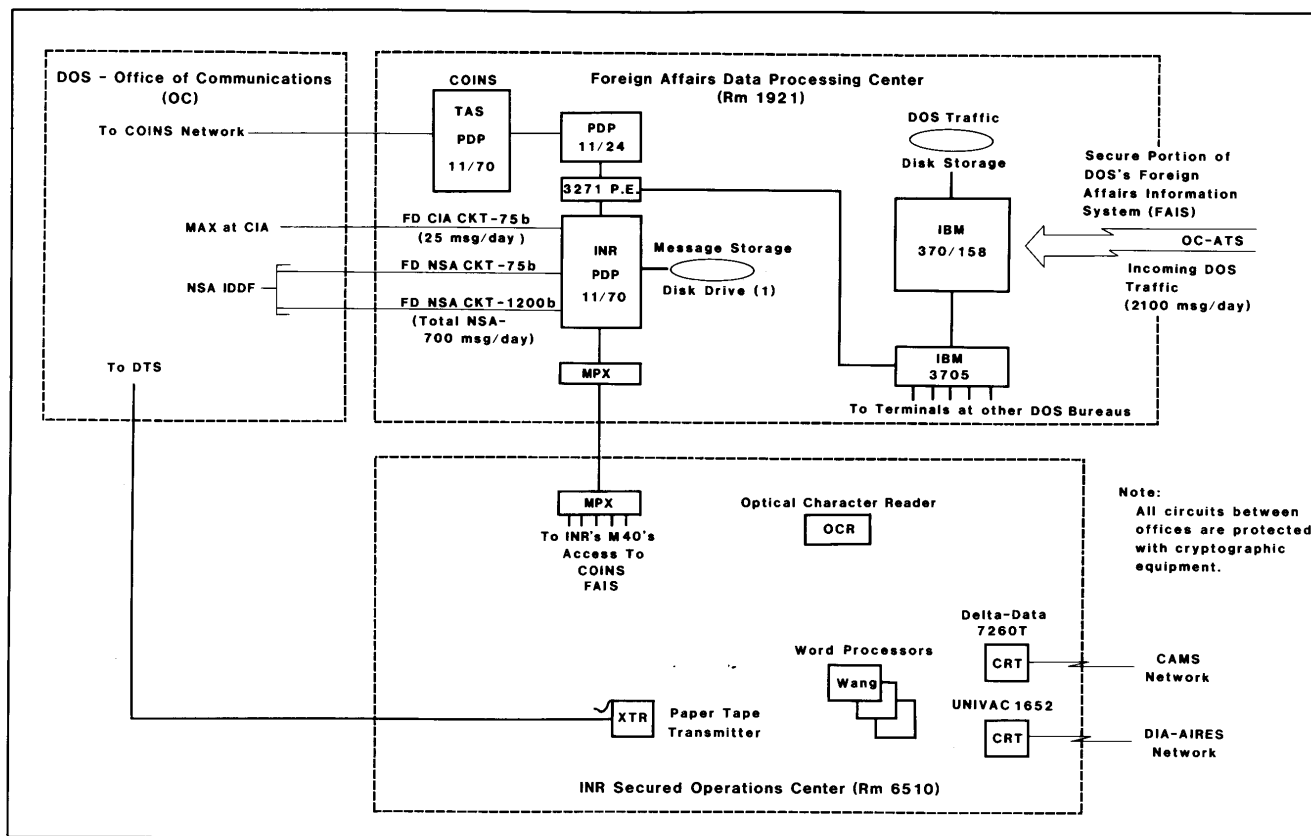ISO is presently developing an additional capability for the INR system which will:

— assist the communicators by retrieving NSA traffic, being able to add a new message routing header so that traffic can be retransmitted without retyping, and providing automatic acknowledgements of received CRITIC and FLASH messages;

— disseminate traffic by analyst profiles (NSA traffic can be disseminated because they contain TAGS. A profile system will be provided for routing to analysts based upon TAGS.); and

— interconnect the INR information handling system with COINS and FAIS. This addition would permit an analyst at any INR terminal to gain access both to the data bases found in the COINS network and FAIS.

Figure 4 represents the planned INR ADP system configuration after the above improvements have been accomplished. It is expected that it will take at least one year before these enhancements are fully implemented. FY 1985 resources have been requested to purchase 15 additional Model 40 Teletype machines to ensure that one work station is available for every two analysts in the INR secure working area. Purchase of an optical character reader is planned so that paper tape can be developed from typed material for more efficient and rapid transmission of INR's products to overseas posts. In order to connect the COINS TAS (Terminal Access System) directly to the INR PDP 11/70, a PDP 11/24 computer, and a 3271 P.E. (Protocol Emulator) has been proposed as a solution. The cost of the COINS connection would be about $75,000 and would be financed by the COINS program office. The online interface with COINS would provide the analyst access to NSA's WINDMILL system (WINDMILL can provide the analyst access to the SOLIS and WEEDER data bases, SIGINT and a partial file of DOS messages, respectively), NPIC's NDS, and CIA and DIA data bases.

The message profile software which would be implemented was developed earlier by ISO.

Although in FY 1984 $610,000 in additional operating funds have been requested for the WANG word processing program, there does not appear to be any plan now available to interconnect these terminals into the INR ADP system. INR estimates that an additional thirteen word processing systems, which these resources will purchase, will be required to provide INR with a fully adequate word processing capability. In FY 1983 INR purchased five WANG units, three of which are located in the secure area.

ISO currently plans to replace the IBM 370/158s used in the FAIS with more powerful hardware such as the IBM 308X series. This study does not address the

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DOS – Office of Communications (OC)

To COINS Network

MAX at CIA

NSA IDDF

To DTS

COINS

TAS
PDP
11/70

Foreign Affairs Data Processing Center (Rm 1921)

PDP
11/24

3271 P.E.

FD CIA CKT-75b
(25 msg/day)

FD NSA CKT-75b

FD NSA CKT-1200b
(Total NSA-
700 msg/day)

INR
PDP
11/70

Message Storage

Disk Drive (1)

MPX

DOS Traffic

Disk Storage

IBM
370/158

IBM
3705

To Terminals at other DOS Bureaus

Secure Portion of
DOS's Foreign
Affairs Information
System (FAIS)

OC-ATS

Incoming DOS
Traffic
(2100 msg/day)

MPX

To INR's M 40's
Access To
COINS
FAIS

Optical Character Reader

OCR

Note:
All circuits between
offices are protected
with cryptographic
equipment.

XTR

Paper Tape
Transmitter

Word Processors

Wang

Delta-Data
7260T

CRT

CAMS
Network

UNIVAC 1652

CRT

DIA-AIRES
Network

INR Secured Operations Center (Rm 6510)

INR's Planned Operating Configuration

Figure 4

hardware connection problems, if any, and the system configuration after the installation of the new IBM computer. ISO does not anticipate any interconnection changes.

INR's PDP 11/70 is located in a vaulted area adjacent to the ISO systems in Room 1921 of DOS.

Planned Office Space

INR is currently dispersed on five floors (8th, 7th, 6th, 4th, and 2nd) in the Main State Building. In December 1983 or in January 1984, the renovation of INR's secure area is scheduled to begin, which will add an additional 12,000 square feet of secure office space for a total of 25,000 square feet of secure space. Figure 5 is a floor plan indicating the new office layout with an indication of the INR groups which plan to occupy this space in Room 6510. The planned move of the Office of Analysis for Near East and South Asia (INR/NESA) will consolidate some major INR offices into a secure area. The additional secure office space should permit greater utilization of the INR ADP system. It is expected that the new space will be available for occupancy by the spring of 1984. Other office shifts of INR groups are also planned with this move. The area occupied by the Imagery Center of Figure 5 represents the additional office space.

COMPARISON OF EXISTING NFIP ADP SYSTEMS

This section identifies and examines Community ADP development efforts or systems currently in operation which may be applicable to INR's needs. In considering systems which might be applicable as a solution to this problem, CIA's CMASS and SAFE and DoD's INSCOM, IAIPS, RAPIDE, and MAXI were considered. Some of these systems represented unsupported single installations, systems in the early developmental stages, systems experiencing difficulties, systems not in the proper size range to meet INR's requirements, or systems requiring long-lead installation times. After examining the above systems, it appears that only the Air Force-developed MAXI (Modular Architecture for Exchange of Intelligence) and CIA's SAFE (Support for the Analyst's File Environment) could be considered as possible system candidates because of system status and level of technical development. There are no other Intelligence Community systems which now appear to match INR's requirements other than these two. Only summary descriptions for each of these systems will be found within this section. Based upon this summary information an analysis of the merits of these two systems will be provided.

MAXI System

The MAXI system was developed by the Air Force through the Common-User Baseline for the Intelligence Community, CUBIC, approach. This philosophy provided for centralized development and maintenance of software to improve system capability and technology transfer, and eliminate excessive redundant software costs. In addition to the MAXI system, the Communications Support Processor (CSP),
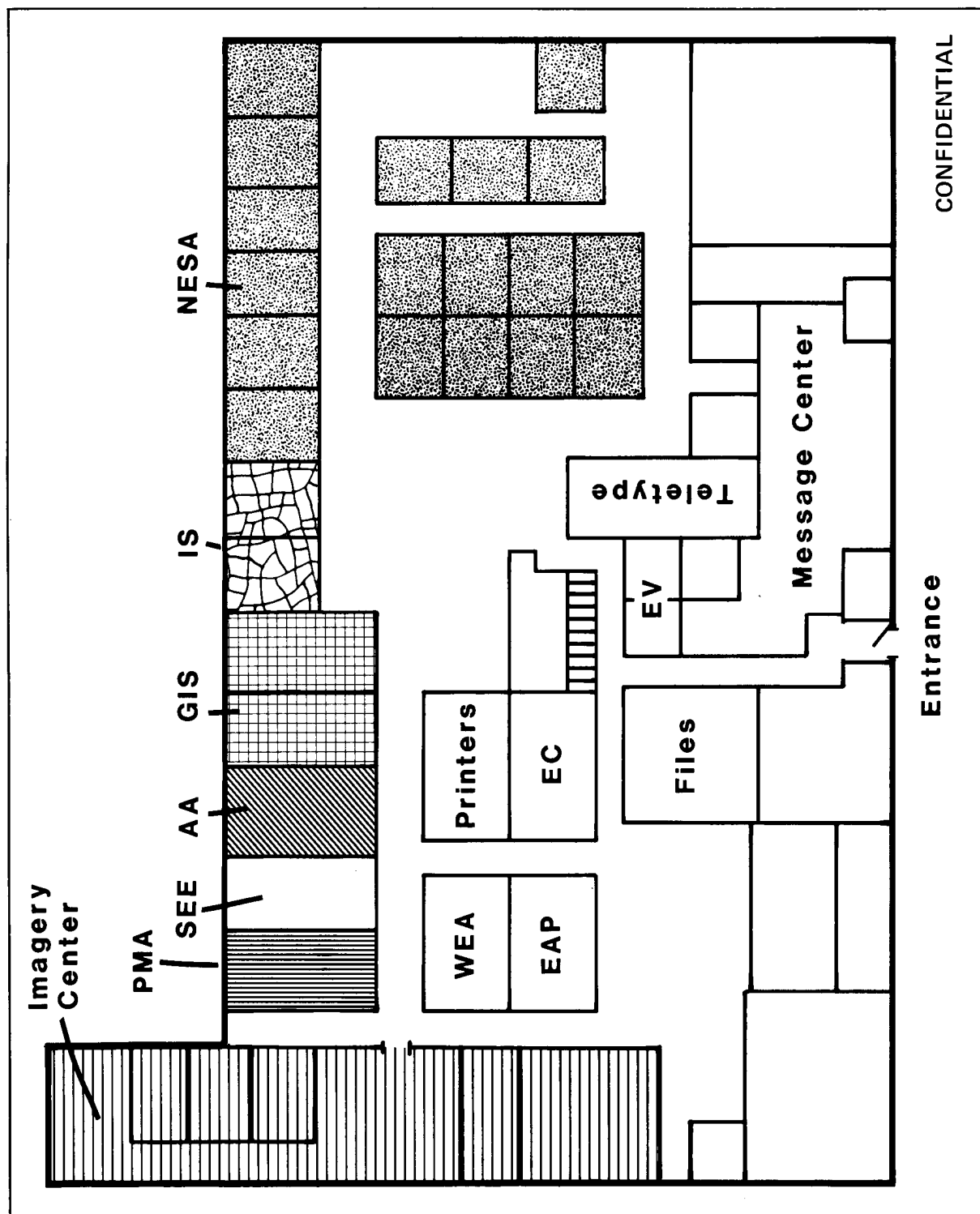
INR's Planned Office Space

Figure 5

Computer Aided Tactical Information System (CATIS), and the Computer Aided Electronic Warfare Information System (CAEWIS) were developed under this concept. Based upon the perspective found within the Community, the CUBIC concept works very well.

The MAXI system is a PDP 11/70 (AN/GYQ-21[V]) computer-based system. Since the initial system development, 14 systems have been installed at various military locations worldwide. The presently installed systems use the UNIVAC 1652 dual-display CRT terminal; however, AFIS, through RADC (Rome Air Development Command), has developed a replacement for this unit employing the Delta Data 7252T terminal. The Teletype Model 40 printer is used for hardcopy printout. Incoming traffic can be routed to one or more of the 64 sub-areas or mail boxes by an analyst-formulated profile. The profile would be by subject, text content, date and time group, etc., up to a maximum of seven separate parameters. Each sub-area can contain a maximum of 1,000 references to messages. The actual message file size is dependent upon the particular site configuration. Incoming messages are queued for each sub-area and are sequenced by time of receipt and within precedence. There is an automatic audio/visual alarm and confirmation message generated for each FLASH and CRITIC message received in the system. In addition messages can be filed for future reference. There is a master file contained in the system of all traffic received. Traffic found within this file cannot be changed by an analyst working on the system.

An analyst at the MAXI terminal can build, or compose, and send a message with supervisory approval. This can be accomplished by creating a new message or editing an incoming message withdrawn from the master file. The analyst can prestore headers for addition to messages for transmission if desired.

An analyst working at the system can store and protect information in a working file. Items remain in this working file until the analyst deletes the information. There is one working file available per sub-area. Each terminal on a system is associated with a "hold queue" for temporary storage of up to 99 items. This is used for short-term system storage as a means of freeing terminals for more urgent and immediate business.

If an analyst desires to transmit information to another analyst on the system, it may be accomplished by the "intracom" feature. This capability provides an analyst with the ability to confer on a subject prior to transmitting a message. The analyst also has the ability to edit traffic by moving and copying information, highlighting designated text for identification, inserting new text of varying lengths, opening a space for a new line, correcting an existing line, reparagraphing or reformating text, converting text from upper to lower case, and setting the keyboard for upper or lower case.

A basic MAXI system composed of one PDP 11/70 with 512K words of core storage and 200Mb of mass storage, can support approximately 15 interactive terminals with a system activity of 1,000 messages per day. With the addition of a second PDP 11/70, the number of interactive terminals can be increased to 54 with a system activity increased to 3,000 messages per day.

With the change from the UNIVAC 1652 to the Delta Data 7252T terminal, the terminal cost has been reduced from about $30,000 to $5,000-$7,000 per terminal. This cost is lower than the cost of a Teletype Model 40 terminal. It is anticipated that the Delta Data terminal will be available for MAXI system delivery in about six months to one year. USAFE and REDCOM are testing this new terminal with their MAXI configurations.

A MAXI system could be installed with about six months of technical preparation which includes a site survey, required hardware installation, special coding , etc. Because of other priorities, no new MAXI systems could be installed until after 1 January 1984. The cost for these technical services is about $100,000. The on-site maintenance and ongoing software modification could be provided by the MAXI prime contractor, Inco, Inc., for $80,000 per year. If it is desired not to use Inco, Inc., a subscriber fee of $50,000, payable to the AF CUBIC organization, is required.

In the event that the present PDP 11/70 and mass storage devices are not suitable for MAXI conversion, new hardware acquisition could cost $700,000-$1,000,000 for the central processing unit, multiplexers, and magnetic disks. The cost of the Delta Data terminals and hardcopy printers would be extra, depending upon the number purchased.

Based upon discussions with the MAXI (CUBIC) program management office, it is planned to provide an interface to IBM systems by mid-1984 with a DEC VAX 11/730. It is also planned to interface the MAXI systems with the DODIIS network. The DODIIS network interface to the COINS network is planned for sometime within the next two years.

SAFE System

The existing SAFE system, which is called SAFE Early Capability, consists of three separate software packages as follows:

Message Analysis Software - This software is used to compare the incoming message traffic against a predetermined profile as specified by the intelligence analyst. The message profile could be by subject, keyword, etc.

Text Message Retrieval - This software permits an analyst to retrieve text from the data base against keywords and all significant words in the text. Ninety days of full text traffic can remain on line within the system, limited primarily by the amount of disk storage capacity.

Text Processing - This software provides the analyst with the ability to provide text editing and processing capability normally associated with word processing systems. Traffic can be stored in a working file, sent to another analyst, edited, etc.

Each of the above software packages are presently independent of one another. Although work is proceeding to integrate these capabilities into a single coherent system, an analyst is presently required to log on to each separately to gain access to a

package's capability. The existing SAFE system could be configured to support 60 concurrent users, but it is really intended to support more than 200 users with a traffic input of 3,000 messages per day. The hardware configuration supporting the SAFE Early Capability is an IBM 3083J, which costs about $2,000,000. A COINS interface is planned for the DIA/SAFE system through the DODIIS network. Present plans call for this interface to be completed in 1985 or 1986.

Analysis of Systems

The SAFE system is too large and still an unproven system to consider as a solution in the INR ADP support problem. Although DOS's Information Systems Office is in the process of upgrading their present IBM 370/158 configuration with an IBM 308X series machine, any thought of combining the FAIS with a SAFE system software capability would not be practical. SAFE, in its present form, is an incomplete system. Under the present Community Information Retrieval System (CIRS) plan, the DIA/SAFE system will provide retrospective retrieval capabilities to INR analysts accessing message files through COINS. This planned capability should be considered in the design of an INR system. Any attempt to meet other INR requirements through the SAFE system would probably introduce unwanted complexity into the further development and implementation of the SAFE project, as well as the INR ADP support system.

The Air Force MAXI system could provide INR with a workable system configuration which would disseminate traffic based upon an analyst's profile; store and retrieve messages; and provide for an analyst working file and message editing, composition, and transmission. It is possible that part of the present INR PDP 11/70 computer and peripheral equipment could support the MAXI software. It is also understood that the messages now being received by INR from both NSA and CIA are in the JANAP 128, DOI 103, format. This would be a compatible message format used within the MAXI system. The system message traffic handling volumes required by INR appear to be within the MAXI capability.

An immediate problem does exist with the MAXI-COINS interface. This area would require further investigation to determine if the COINS network could be connected to MAXI so that the analyst could have access to other Community data bases directly from his terminal.

The Teletype Model 40 CRTs and page printers now being used by INR would have to be replaced with the Delta Data 7252T terminal. The Model 40 equipment is basically a standard item used by the DOS's ISO and Office of Communications in support of their terminal requirements. Some modification, however, might be required before these machines could be used in some applications. It is not known if there will be a problem of interfacing the MAXI terminals with FAIS for retrieval of DOS traffic.

It appears that the MAXI system in a single machine configuration could support INR's present terminal needs. In a two-machine configuration, MAXI could support INR's future terminal needs of 50 terminals. However, because of system backup considerations and ISO's operations, two machines are really required to support INR. The physical space problem in installing a dual MAXI configuration in the ISO vaulted computer room is a problem area.

The interfaces of the WANG word processors into the INR computer system is an unknown if the MAXI is used.

Since INR would like to interface into the FAIS automatically from an analyst's terminal, the planned interface to an IBM system from a MAXI configuration probably could solve this requirement.

By far, the most important consideration in the selection of a replacement computer system for INR is the level and quality of technical support in the area of software upgrades, enhancements, etc., which could be expected. With the Air Force's commitment to fourteen installed MAXI systems and the use of the MAXI as the DODIIS standard message processing configuration, the technical support which INR could receive would be exceptional.

CONCLUSIONS AND ADP PLAN

This section sets forth conclusions and observations which surfaced during this study. It is perceived within DOS that INR produces an intelligence product that has been well developed and is timely. However, the product has problems involving distribution to the various DOS Bureaus and can lose its effectiveness because of this problem. The solution to this problem might be accomplished if an improved ADP system were installed.

Conclusions

The last time an attempt was made to consolidate ADP requirements within INR was in the 1975-1976 time frame. Since that time the circa 1976 requirements documentation has been addressed on a piecemeal basis with the expectation that some day the system requirements would be available. This has been a slow, agonizing, and ineffective means. It was believed that the system, as originally designed, was too grand, too large, and too complicated. The design tried to be all things for all people and immediately reached the state-of-the-art of technology as it existed seven years ago.

The design support that ISO was able to provide INR was insufficient to meet the functional system requirements. In fact the internal INR support in terms of personnel being able to monitor and to contribute to an ADP system upgrade also appears to be inadequate. The INR staff that has been assigned this responsibility is distracted by the day-by-day operational problems. INR is a small portion of the overall DOS's information system and necessarily ranks relatively low on the list of priorities.

INR does not now have a system that is responsive to their present requirements or future needs. The system is only able to receive messages from NSA and CIA and with no traffic dissemination. Message preparation is accomplished by marking up hardcopy, retyping, and transmission via paper tape. The WANG word processors are not integrated into the system and are used only as stand-alone word processing

devices. Many Teletype Model 40s are in storage and can not be installed until the renovation of Room 6510 is completed.

Throughout this study it became apparent that no single individual who was interviewed was aware of the complete present "information handling system" of INR or that any future requirements were adequately defined. Any planning or system implementation that is being accomplished is fragmentary.

The automation functions serving INR are well behind those found within other segments of the Community. The single planned improvement in accessing COINS and DOS messages from the INR system terminal would greatly enhance the analyst's capability.

In order to provide a system to INR, a suggestion was made to use unique software packages found in other systems and attempt to integrate these with the present INR software. Based upon experience, it has been found that a system developed on this basis is difficult to install, operate, and maintain because nothing really works well together, it is uneconomical to operate, and system documentation is not available or is incomplete.

INR ADP Plan

As a result of this study it is recommended that the following ADP plan be initiated:

1. Continue with the installation and implementation of the COINS interface. The solution for the COINS interface appears to be near for a relatively small amount of resources. The developed solution might also be applicable for a future system upgrade.

2. Since the software is available to provide profiles to distribute NSA traffic based upon TAGS, this effort should be continued. If the software tests are satisfactory, this capability should be implemented.

3. Since there has been no apparent definition of information handling requirements since the mid-1970s, INR should engage a contractor to define present and projected analyst work flows, system requirements, and system architecture. As an integral part of this analysis, the contractor should review the Air Force MAXI system as a possible replacement for the present INR system and independently verify that there are no other systems which should also be considered. The MAXI system has the advantage in that it might be able to use some portion of the existing INR PDP 11/70 hardware. The level of effort required for an in-depth study of this type would be about $150,000 and require approximately seven months to complete. If the MAXI system could meet INR's requirements, this system probably could be installed and in operation within one year of a notice to proceed. With the resource profile indicated below, INR could have a workable ADP support system in 18 months. A proposed contractor's statement of work is found in the Appendix.

4. An individual within INR should be assigned the responsibility for the system upgrade, and this should be the *only* responsibility for this Project Officer until

all facets of the system are installed. This individual should report to the Deputy Assistant Secretary of INR and should remain at least five years on this project. In support of this individual a "Verification and Validation" (V&V) contract should be awarded. V&V support involves assisting the Project Officer in design reviews and feasibility studies, and advising the Project Officer regarding technical and program issues. The V&V representative reviews contractor documentation, develops test plans, conducts acceptance tests, and prepares test reports. If a technically competent individual cannot be found within or assigned to INR by the DOS after the mid-point of the above study is completed, it is recommended that an individual from the Intelligence Community be assigned to this position on a rotational assignment.

5. No additional Model 40 terminals or OCR equipment should be purchased until the system requirements and architecture are defined and only then if they can be used within the new system architecture.

6. ISO is on the verge of installing and converting to an IBM 308X configuration to upgrade the present FAIS IBM 370/158 system. This conversion is a major undertaking, and the INR system upgrade should not draw upon personnel resources found within ISO. In view of this condition, INR should not rely upon ISO for system support but should retain a contractor for this purpose.

7. In order to ensure that the upgrade of the INR automated system is coordinated properly and is responsive to INR needs, an IC Staff Action Officer should be assigned to this project to monitor and to influence its progress. The IC Staff Action Officer could monitor and direct the study contract in the early tasks until Recommendation No. 4 above is implemented.

Since it appears that the INR ADP system requirements are very close to the MAXI, it is suggested that the MITRE Corporation be considered as the study contractor. MITRE has been associated with MAXI at numerous installations as the V&V contractor. An alternate approach would be to procure the study contract competitively with only the V&V contract awarded to MITRE, Corp.

Resource Implications

In FY 1984 no resources are available for new ADP initiatives. However, $610,000 is available for the purchase of 13 additional WANG word processors. It is recommended that the $150,000 for the recommended study be reprogrammed from these resources and the word processing shortfall be added in FY 1985. By providing the study money in FY 1984, the information handling study can start. The results of the study could also influence the interconnection of the WANG word processors into the ADP system. If this alternative appears to be unworkable, INR's management could approach the DOS management for these resources.

Table 2 represents the resource profile which might be considered for the INR ADP upgrade. The accuracy of the total resource requirements of $3,150,000 over the five-year period is probably very high. The allocation of the resource requirements by year and within each year is less accurate. The information handling study would address this resource profile. Without the INR staff support as found in Recommendation No. 4 above, the magnitude of resource funding should not be provided.

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Appendix

PROPOSED STATEMENT OF WORK

Study Purpose

The purpose of this study contract would be to investigate INR's work flow by defining the input and output requirements of INR based upon its mission and to determine the technique and scope of the amount and detail of effort required to produce the various intelligence products. Based upon this analysis, ADP system requirements should be produced which could provide INR with a state-of-the-art, user-friendly, automated system. The requirements and architecture should be scoped in such a fashion to permit the installation of discrete hardware and software increments with interfaces to other system enhancements as they are developed. The study should also determine: (a) if the Air Force MAXI System in its present or planned configuration could reasonably be adapted to meet INR's ADP support requirements; (b) if there are other existing hardware and software systems which could better be adapted to INR's information handling support requirements; and (c) if continued development of the present INR support system would offer the preferred means of satisfying the ADP support requirements.

Tasks:

I   **Study Planning** - Review background information and present status. Schedule interviews with all levels at INR and ISO. Construct questionnaires to collect data. (1/2 month)

II   **Data Collection** - Conduct interviews and determine work flow criteria, documentation, etc., of intelligence analysis and products. (1 and 1/2 months)

III   **Analysis** - Based upon the data collected, determine information handling requirements for INR. (1 month)

IV   **System Requirements** - Based upon the analysis, determine INR's ADP requirements in a modular fashion so that a system could be installed in incremental steps. (1 and 1/2 months)

V   **Systems Analysis** - Based upon the developed system requirements, determine whether MAXI, another existing system, including SAFE, or the development of the existing INR ADP support system should be utilized to meet these requirements. This analysis should weigh costs, implementation schedules, risks, etc. (1 month)

VI(A) **Alternate System** - If it is determined that the MAXI or some other existing system should be utilized, develop a detailed implementation plan indicating schedules, system parameters, resource requirements, and hardware and software modifications. (1 and 1/2 months)

VI(B) INR Support System - If it is determined that the most prudent alternative is the continued development of the existing INR ADP support system, develop a detailed implementation plan indicating schedules, resource requirements, system parameters, and hardware and software modifications. (1 and 1/2 months)

Total: 7 months.

Documentation and reports are required for each of the above tasks.

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